

# iMOOC: An Introduction to Radio Communication for Pilots-The Essentials

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Learning Design & Technology



How many of you have ever **flown** on a plane?

# The Project





# The Project

iMOOC

<http://edtechservices.org/>

## The Story

The purpose of this instructional design project was to develop an iMOOC (interactive Massive Open Online Course), which was intended to increase radio communication awareness and competency.

## What's an iMOOC?

- interactive Massive Open Online Course
- WordPress platform
- Live Chat, Social Media, Forum
- Instructional Videos
- Assessment

# The Agenda

- How it began
- Project process
- Topic Identified
- Design Theory & Strategy
- iMOOC Design and Development
- Data Analysis
- Results
- Implications



How it Began  
**Interested in pilot-controller communication**



## How it Began **Pilot Fatality**

WFTV Eyewitness News <https://twitter.com/WFTV/status/555794024456781825/photo/1>

# How it Began

NTSB Brief of Accident

Update 4/14/16

“She **did not** display the ability to adequately **communicate** her **situation** to the controller, ***nor*** *did* she seem to **understand...**”

# How it Began

NTSB Brief of Accident

Update 4/14/16

“During post accident interviews, the air traffic controllers indicated that they **had not received** FAA-required evidenced based simulation **training on emergencies** and described **the computer-based emergency training** that they received as **poor quality.**”



## How It Began

### Research Questions

1. “How does the iMOOC course design help increase awareness and communication competency of pilots?”
2. “How does the course design impact interactivity?”
3. “How does the use of video and social media impact learning?”

How it Began

**Need for free & interactive online training**

# Project **Process**

## Topic **Identified**

- Free and interactive training = **iMOOC**
- Pilot fatality = **An Introduction to Radio Communication for Pilots**

# Design **Theory** & Strategy

## Design **Theory** & Strategy

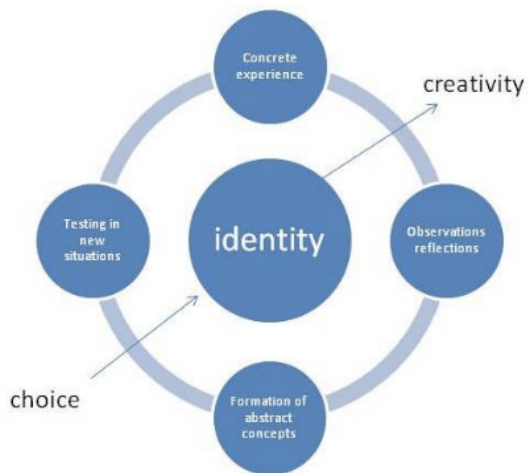
Theory = **Connectivism**

The iMOOC integrates a connectivist approach (Kopp, 2011).

Connectivism is the thesis that knowledge is distributed across a network of connections (Downes, 2012).

Knowledge resides within systems, accessed through the **active participation** of learners.

Process of **creating connections** and **developing networks** (Siemens, 2005).



# Design Theory & **Strategy**

Strategy = **Scenario based e-Learning (SBeL)**

“a pre-planned guided inductive learning environment designed to accelerate expertise in which the learner assumes the role of an actor responding to a work-realistic assignment or challenge, which in turn responds to reflect the learner’s choices” (Clark, 2012).”



## Design Theory & **Strategy**

The **Scenario Based e-Learning (SBeL)** strategies used for radio communication range from simple to complex.

Ex: Lesson one, Breakdown of a Call begins with a **call sign** followed by “**who you are calling, who you are, where you are** and **what you want**” (FAA, 2006)

### Scenario

You are the pilot in command of N123, Bell Helicopter 206 flying over Pearl Harbor bay. You are calling Honolulu approach to request clearance to enter class Bravo airspace. In what way would you identify yourself to HNL approach?



# iMOOC Design and Development

# iMOOC **Design** and Development

WordPress setup + eLearning Theme + Customization



Finish Quiz

Time remaining  
**0:09:45**  
mins/secs

Questions List

### Quiz 1: Breakdown of a Call

Teacher: admin

While flying a helicopter over Pearl Harbor bay, you need to identify the type of aircraft you are operating. What is the correct phraseology to use?

- ☐ Dauphin
- ☐ Cessna 152
- ☐ Helicopter
- ☐ Embraer 100

Finish Quiz

Time remaining  
**0:06:40**  
mins/secs

Questions List

### Quiz 1: Breakdown of a Call

Teacher: admin

Using the ICAO phonetic alphabet, how would you spell "pilot"?

- ☒ Papa-India-Lima-Oscar-Tango
- ☐ Papa-Italia-Lion-Oscar-Tango
- ☐ Peter-India-Lima-Oscar-Tango
- ☐ Papa-Italia-Lima-Oscar-Tango

Back

### Pre-Flight

- ☐ Pre-Flight Survey

### Lesson 1

- ☒ Introduction - The Essentials
- ☐ Breakdown of a Call
- ☐ What is a Call
- ☒ Identification of Aircraft Type
- ☐ Emergency/Distress
- Communication
- ☐ State Who You Are
- ☒ Quiz 1: Breakdown of a Call

### Identification of Aircraft Type



ICAO phonetics is the way we communicate our call sign to an ATC or to another aircraft.

Complete Lesson
Questions? Chat with us

# iMOOC **Design** and Development

Course content + Assessments

# iMOOC **Design** and Development Features

## Student Study Guide

### STUDENT STUDY GUIDE

#### RADIO COMMUNICATION FOR PILOTS

"Everybody has an idea what they would do in this situation; everyone is just as capable but you never know until you're truly tested."

Michael Campbell, Helicopter pilot

#### Dedication

On January 13, 2015, N757ZM, a Cessna 152 crashed into the Atlantic Ocean about a quarter mile off New Smyrna Beach, Florida. It went down quickly with the loss of one life. The pilot was a former friend and student back in 2011. Outside a number of factors including pilot error, poor and ineffective communication with the control tower was an issue. Her death was preventable. This instructional design project is dedicated to her and all other pilots, whether fixed wing or helicopter. Radio communication is the same for one and all as English is the language of aviation and the need to communicate clearly and effectively is a matter of safety. How to mitigate the risk of miscommunication is an ongoing challenge.

#### Background

In an age when radio communication is a critical link in the air traffic control system, it is essential for pilot-controller communication to be clear and effective. It is essential that pilots acknowledge each radio communication with Air Traffic Control (ATC) by using the appropriate aircraft call sign and to understand the need for brevity. Contact with ATC should be kept as brief as possible. That said; the controller must know what you want to do before he can properly carry out his/her control duties. And you, the pilot, must know exactly what the controller wants you to do. If as a pilot you have an emergency or are in distress, time is of the essence to bring your particular situation to the attention of the controller. You might only have seconds to live. You might have only seconds to clearly communicate what you need.

But how is this done? What does it take for a pilot to gain radio communication skills?

Answer: Through mastering the essentials of radio communication. It is the essence and driving force behind reducing the risk of accidents.

The pilot and ATC, who will help you on your way to understanding the essentials of radio communication, is helicopter pilot Luca Roseano, who is a FAA certified flight instructor, and FAA ATC, Robert Marks.

#### RADIO COMMUNICATION FOR PILOTS



Top picture: Helicopter pilot Luca Roseano.



Bottom picture: ATC Robert Marks.

# GLOSSARY

## RADIO COMMUNICATION FOR PILOTS

### Agusta (Agusta Westland)

A helicopter manufacturer formed by the merger of former companies Agusta (Italy) and Westland (Great Britain).

### Aircraft

Any contrivance designed for navigation of or flight in the air. Air Traffic Control (ATC) – A service that oversees and guides the movements of aircraft and provides safe and efficient flow of air traffic.

### Airport Traffic Control Tower (ATCT)

A terminal facility which, through the use of air/ground communications, visual signaling, and other devices, provides air traffic control services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the movement area.

A facility is established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance service may be provided to VFR aircraft.

### Approach (Approach Path)

The flight path, normally centered within an approach surface, intended for helicopters to follow when landing at a heliport.

### ARTCC

Air Route Traffic Control Center.

### Autorotation

1. A helicopter maneuver to land in the case of engine failure; the momentum of the rotor blades can be just enough to slow the helicopter down just before landing. During a powered flight, the rotor drag is overcome with engine power. When the engine fails, or is deliberately disengaged from the rotor system, some other force must be used to sustain rotor RPM so controlled flight can be continued to the ground.

# iMOOC Design and Development Features

## Glossary

# iMOOC **Design** and Development Features

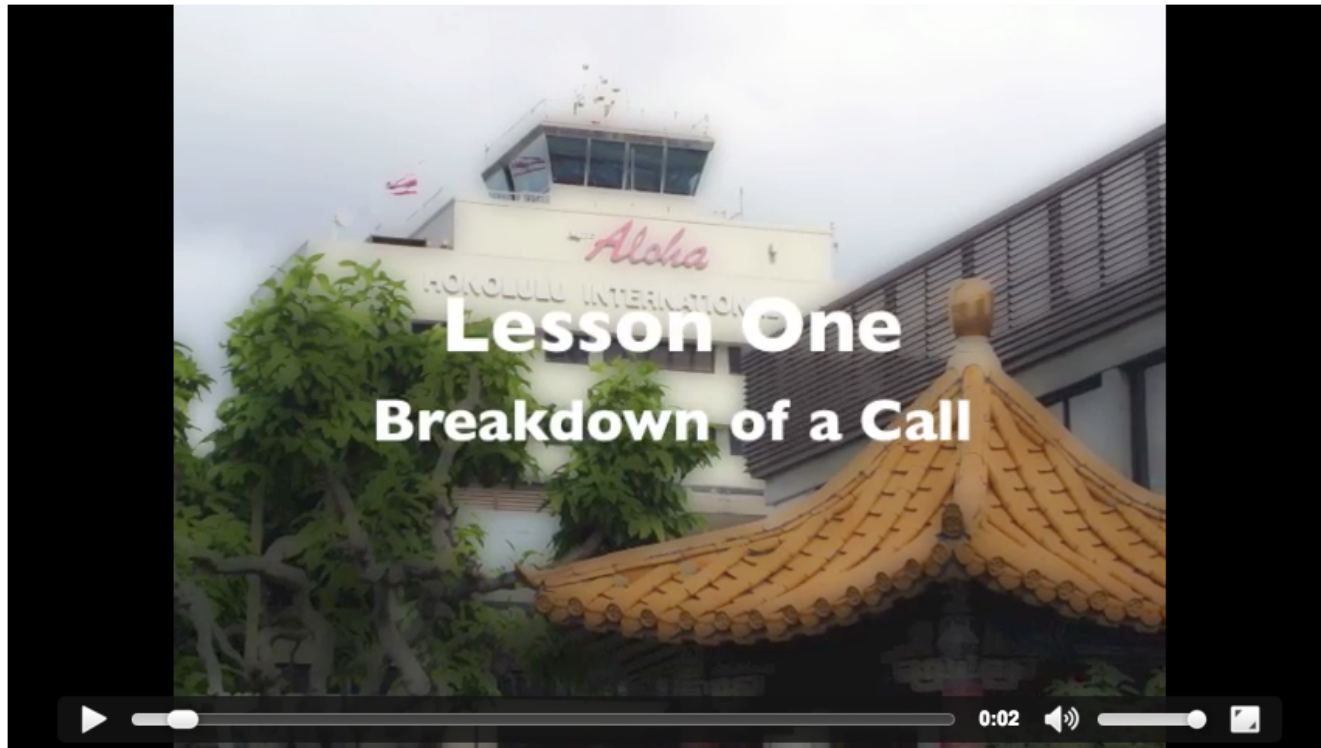
Videos  
Forum  
Live Chat  
Twitter

The screenshot displays the EdTech SERVICES forum interface. The top navigation bar includes links for Home, Contact Us, Course, Forum, and a Logout button. The left sidebar contains sections for Categories (No categories), Archives, and Meta (Site Admin, Log out, Entries RSS). The main content area shows a breadcrumb trail: Homepage → Forums → An Introduction to Radio Communication For Pilots - The Essentials. Below this, a subscribe box states: "This forum contains 3 topics and 8 replies, and was last updated by Bemildo Ferreira 2 months ago." A table lists the topics:

Topic	Voices	Posts	Freshness
Just arrived Started by: Bemildo Ferreira	3	4	2 months ago
Welcome! Started by: Faith	4	5	2 months ago
Breakdown of a call to an approach control Started by: James	2	2	2 months ago

A chat overlay titled "Questions? Chat with us" is visible on the right, containing a message prompt, input fields for Name and Email, and a Start Chat button.

Breakdown of a Call



Complete Lesson

Questions? Chat with us

iMOOC **Design** and Development Features  
Videos



# iMOOC **Design** and Development Features

## Videos

Pre-Flight Survey

Lesson 1

Introduction - The Essentials

Breakdown of a Call

What is a Call

Identification of Aircraft Type


Emergency/Distress Communication

State Who You Are

Quiz 1: Breakdown of a Call

Lesson 2

State Your Situation



Lesson Two  
State Your Situation

⏮ ⏪ ⏩ ⏭

0:00

← State Who You Are

Congratulations! You have completed this lesson.

Pre-Flight Survey

Lesson 1

Introduction - The Essentials

Breakdown of a Call

What is a Call

Identification of Aircraft Type


Emergency/Distress Communication

State Who You Are

Quiz 1: Breakdown of a Call

Lesson 2

Position and Outcomes



Lesson Three  
Your Position and Outcomes

⏮ ⏪ ⏩ ⏭

0:00

← State Your Situation

Congratulations! You have completed this lesson.

← Glossary →

Questions? Chat with us



# iMOOC **Design** and Development Features

## Certificate

EdTech Services 2016



Hereby awards this Certificate in

**Radio Communication for Pilots**

to

**Melissa Jiménez Araya**

# iMOOC **Design** and Development Features

## Forum

Archives

Meta



Site Admin

Log out

Entries [RSS](#)

Comments [RSS](#)

WordPress.org

Author	Posts	Favorite   Subscribe
January 30, 2016 at 4:07 pm		
EDIT   CLOSE   STICK (TO FRONT)   MERGE   TRASH   SPAM   REPLY #3679		
 James	<p>ATC Robert Marks,</p> <p>As a pilot, it is important that an initial call up specify the type of aircraft. However, there are pilots that seldom use "November" before a callsign and there are towers don't as well (Understood. All U.S. planes are November).</p> <p>I agree, initial callup always uses the full callsign including airplane type: "Bonanza 41 Romeo Alpha"</p> <p>Thereafter in replying to ATC, pilots have replied with only the last 3 digits in the callsign e.g. OneRA or 35Tango.</p> <p>ATC usually does the same in the instructions: "1RA" or "Romeo Alpha- turn Left 10 degrees."</p> <p>I acknowledge, using whichever call ATC used; "1RA" or "Romeo Alpha left 10 degrees."</p> <p>Your thoughts?</p> <p>J.</p> <div>This topic was modified 2 months, 2 weeks ago by  James.</div>	
January 31, 2016 at 3:53 pm		
EDIT   MOVE   SPLIT   TRASH   SPAM		

Questions? Chat with

# iMOOC **Design** and Development Features

## Live Chat

The screenshot shows a forum interface for 'EdTech SERVICES'. The top navigation bar includes links for Home, Contact Us, Course, Forum (highlighted), and a Logout button. A breadcrumb trail indicates the current location: Homepage → Forums → An Introduction to Radio Communication For Pilots – The Essentials. A 'Subscribe' section states that the forum contains 3 topics and 8 replies, last updated by Bemildo Ferreira 2 months ago. Below this, a table lists the topics. A live chat overlay is visible in the bottom right corner, prompting users to provide their name and email to receive support.

**EdTech SERVICES**

Home Contact Us Course **Forum** Logout

Categories

No categories

Archives

Meta

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Log out

Entries RSS

Homepage → Forums → An Introduction to Radio Communication For Pilots – The Essentials

Subscribe

This forum contains 3 topics and 8 replies, and was last updated by Bemildo Ferreira 2 months ago.

Viewing 3 topics - 1 through 3 (of 3 total)

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Just arrived Started by: Bemildo Ferreira	3	4	2 months ago
Welcome! Started by: Faith	4	5	2 months ago
Breakdown of a call to an approach control Started by: James	2	2	2 months ago

**Questions? Chat with us**

Hi! Please fill out the following information to receive support

Name

Email

**Start Chat**

# iMOOC **Design** and Development Features

## Twitter



## iMOOC Design and **Development**

Multi media content embedded in the WordPress platform.

Produced high-quality videos (Gao, 2013).

Short segments (Gao, 2013).

# iMOOC Design and **Development**

Videos narrated by a professional pilot.

Captions added for clarity.

Pre-Flight

☐ Pre-Flight Survey

Lesson 1

☒ Introduction – The Essentials

☐ Breakdown of a Call

☐ What is a Call

☒ Identification of Aircraft Type


☐ Emergency/Distress

Communication

☐ State Who You Are

☒ Quiz 1: Breakdown of a Call

Identification of Aircraft Type



ICAO phonetics is the way we communicate our call sign to an ATC or to another aircraft.

0:23

Questions? Chat with us

Complete Lesson

# iMOOC Design and **Development**

Easy Media Player.

Flow Player. Interface adapts to all screens.

Video.js- open source library

## *Course Introduction*

*Learn about radio communication, what it is, how it works, and what it can offer you as a pilot to prepare for unpredictable and unforeseeable situations. This course aims to empower you to understand what constitutes ineffective and effective communication, to think through possible scenarios/outcomes, and apply what you learn, which will enable you to perform under the most challenging conditions.*



Questions? Chat with us

# Data Analysis

## Demographics

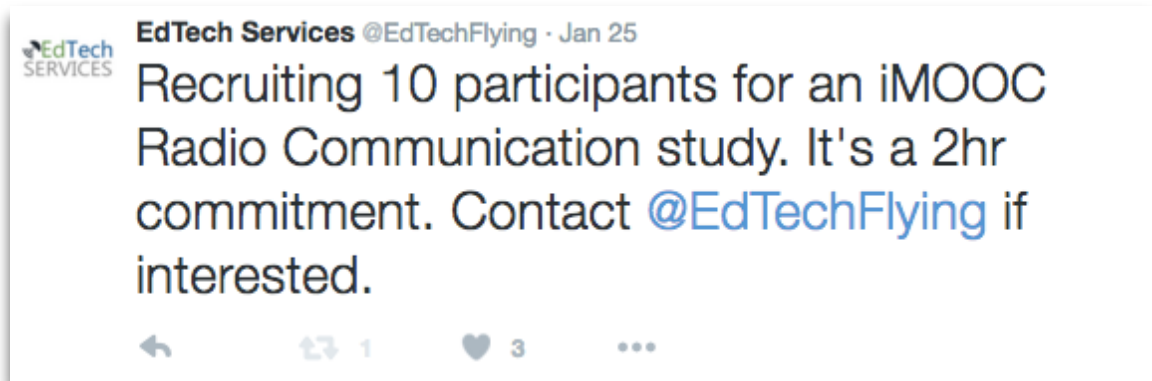
**10** adults participated, **6** females, **3** males, **1** “other”

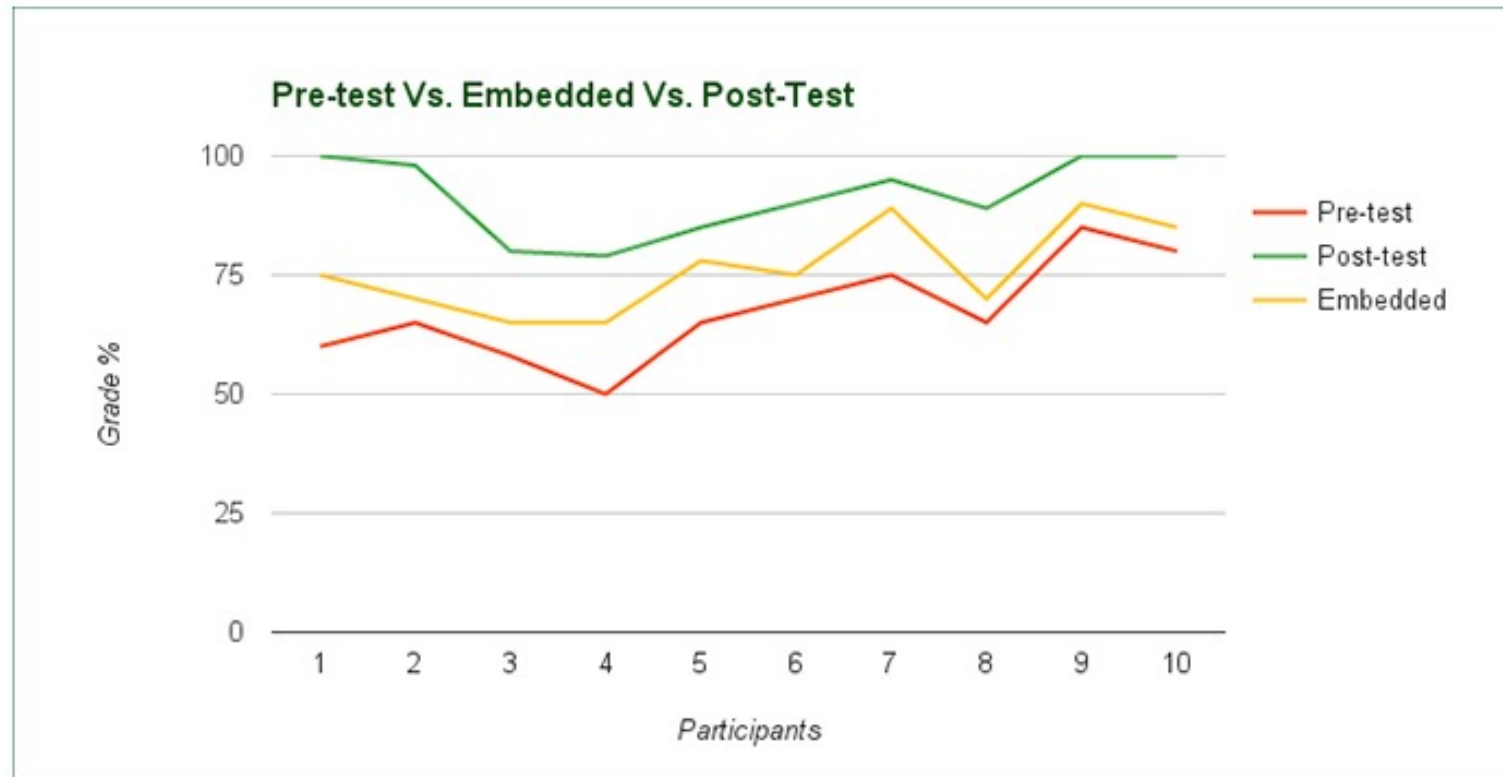
**50%** ages 25-34, **Educated**-some college, 2yrs-4yrs-Master's



# Data Analysis Recruitment

Initiated via Twitter





*Raw Data for Pre-test, Embedded and Post-test Questions (items1-15)*

## Data Analysis Results

### Descriptive Analysis

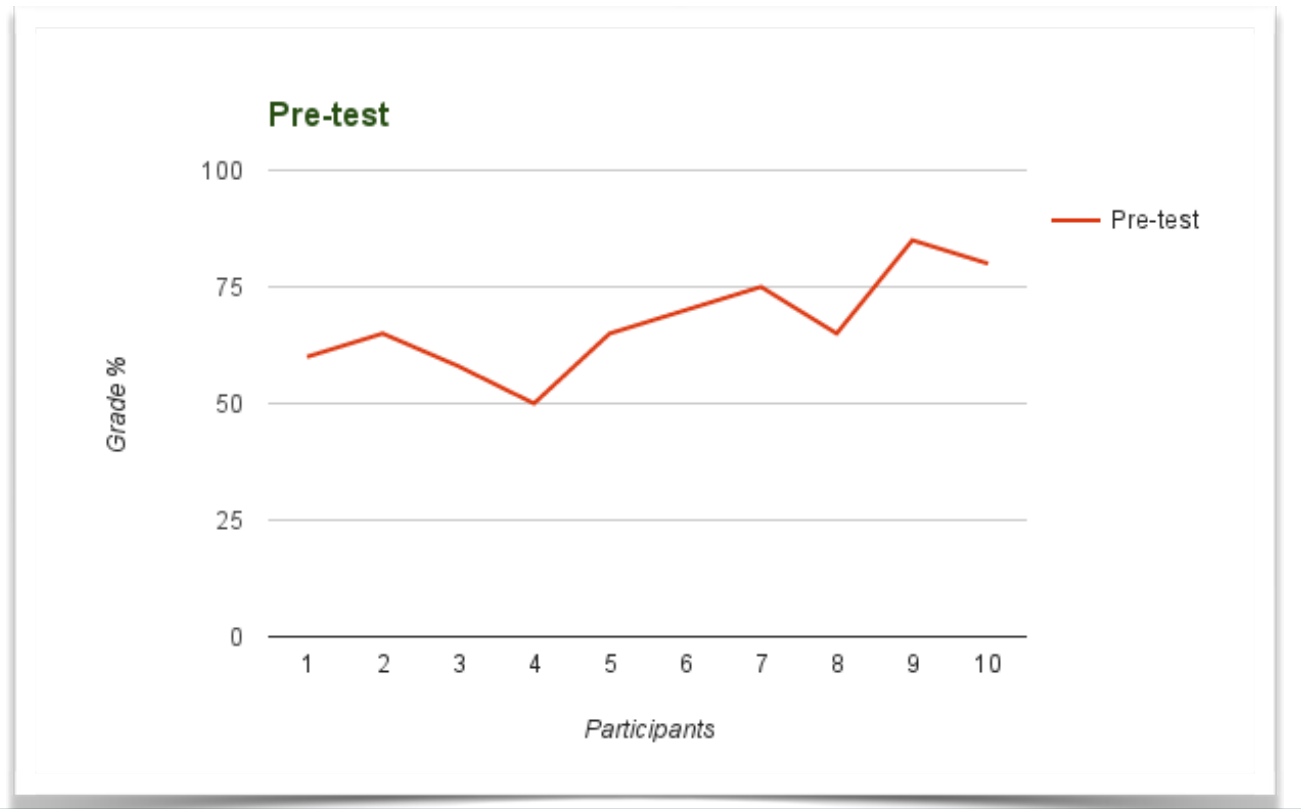
- Pre test
- 3 embedded
- Post test
- Surveys (n=10)

## Data Analysis

- Collected anonymously from iMOOC
- Google Spreadsheet

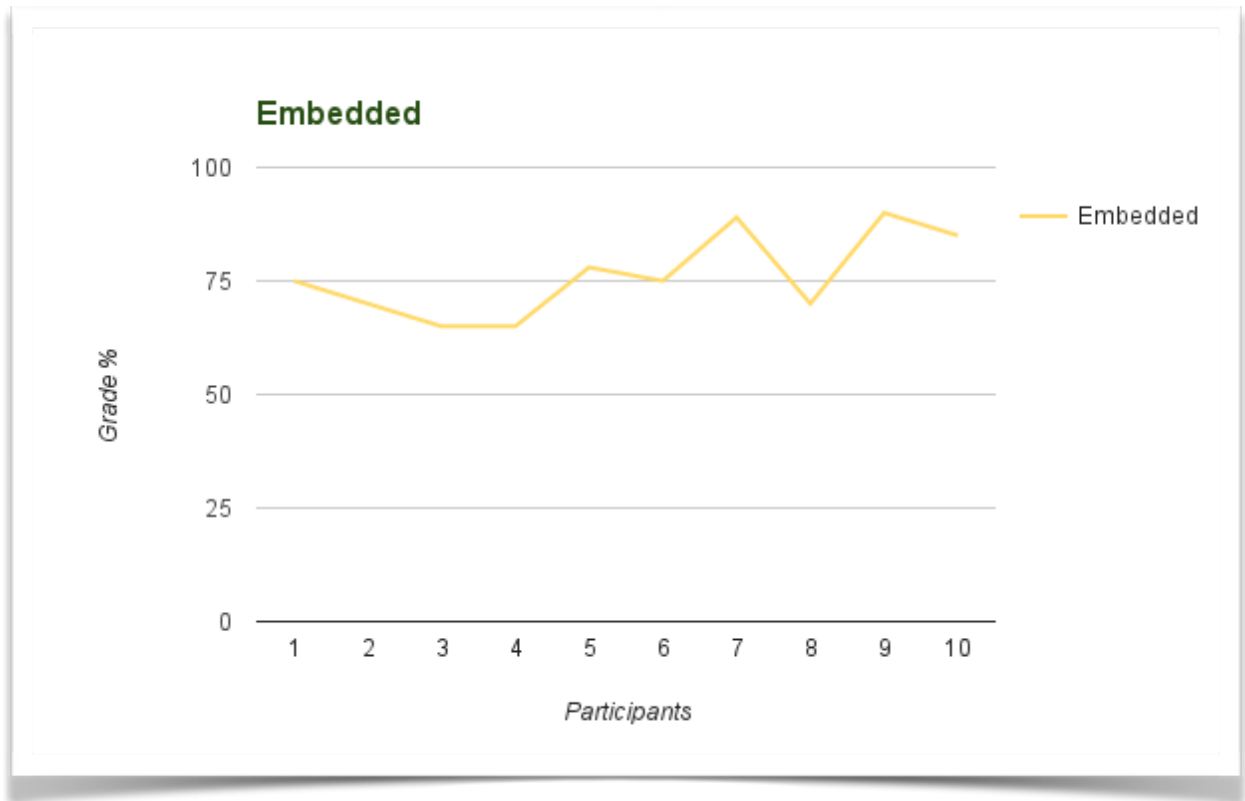
## Data Analysis

### Pre-Test



Average score 66.8%

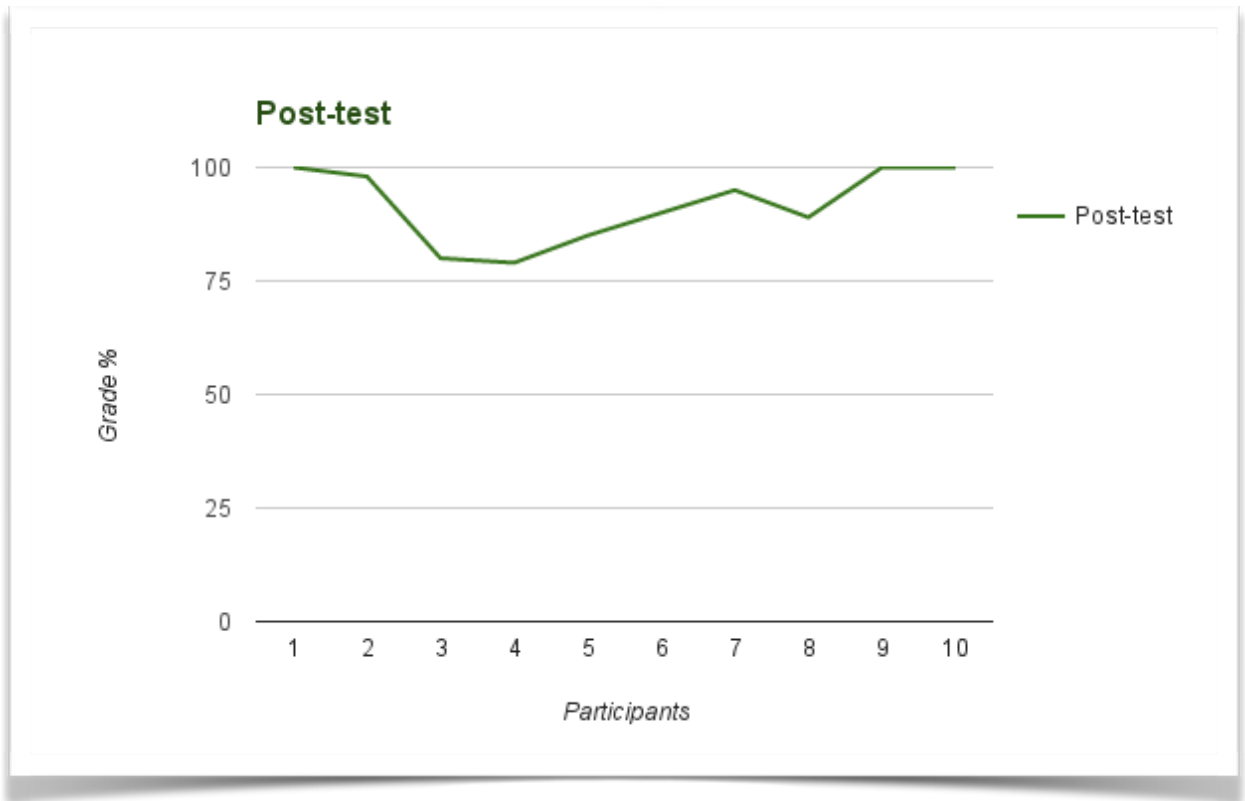
# Data Analysis **Embedded**



Average score 76.2%

## Data Analysis

### Post-Test

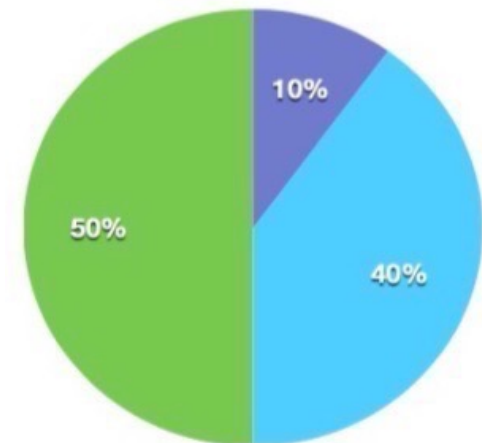


Average score 91.6%

## Data Analysis

### Learning Assessment

- Pre Survey
- Course participation/attitudinal



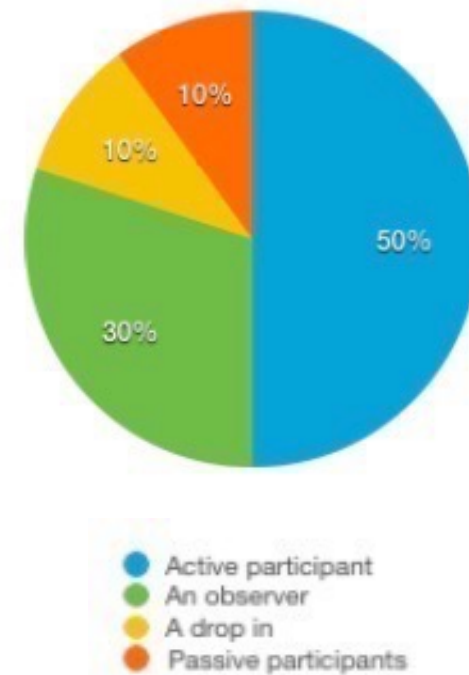
- I am preparing for the ICAO exam
- I enjoy being part of an aviation community of learners
- I would like to improve my radio communication skills

“What was your **reason** for taking this course?”

## Data Analysis

### Learning Assessment

- Pre Survey
- Type of learners



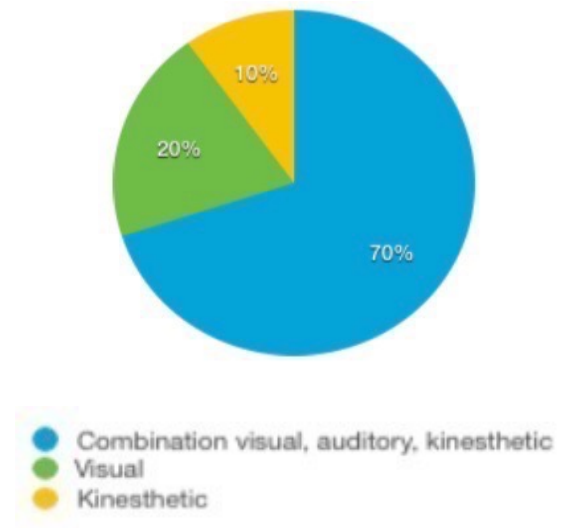
“Which **type of** online **learner** best describes you?”



## Data Analysis

### Learning Assessment

- Pre Survey
- Learning Style

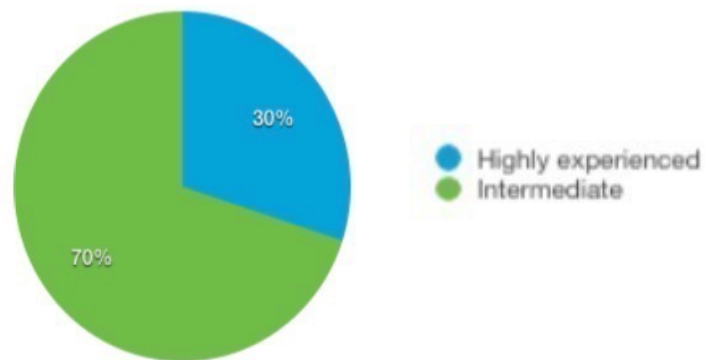


“How would you describe your **learning style**?”

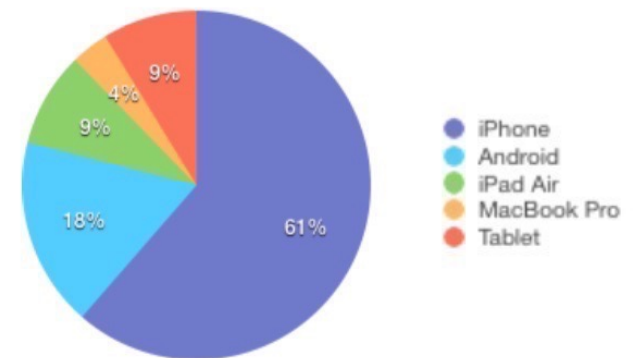
# Data Analysis

## Learning Assessment

- Pre Survey
- Technology + Devices



“How would you rate your ability to use **technology**?”



“What type of hand held **devices** and/or computers do you use on regular basis?”

# Data Analysis

## **Learning Assessment**

- Pre Survey
- Pilot-Controller communication

## Open ended question

“What do you think is the most challenging aspect of radio communication?”

## **Responses**

“Understanding rapid fire communication.”

“Understanding ATC.”

“...understand the direction you were given and executing them correctly.”

“Communicating clearly.”

“Understanding instructions and speaking clearly.”

## Data Analysis

### **Learning Assessment**

- Post Survey
- The Module
- Video
- Social Media-Twitter
- Live Chat
- iMOOC

## Data Analysis

### **Learning Assessment**

- Post Survey
- The Module

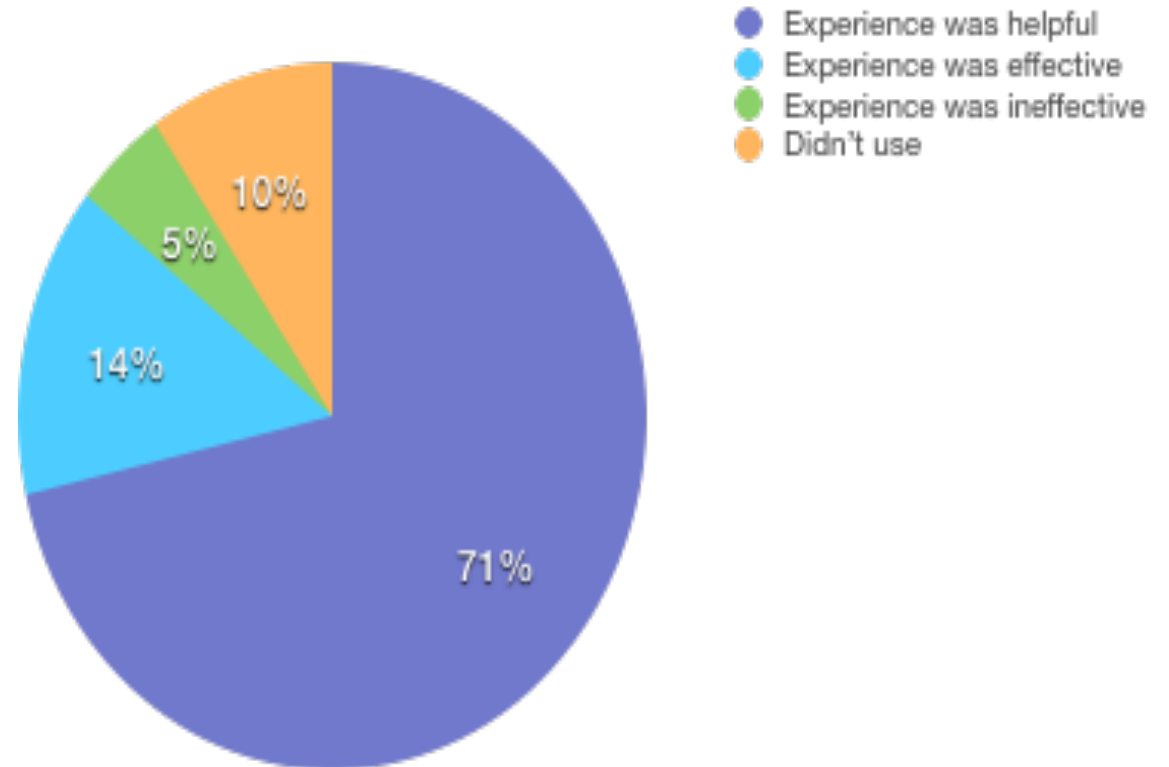
Open ended questions

“What did you like about the module?”

“What did you like least about the module?”

## Data Analysis

- Post Survey
- Live Chat



## Post Survey **iMOOC**

Open ended question

“Would you participate in a future iMOOC?”

## Post Survey **Video**

Open ended questions

“Was the video helpful in learning the essentials of radio communication?”

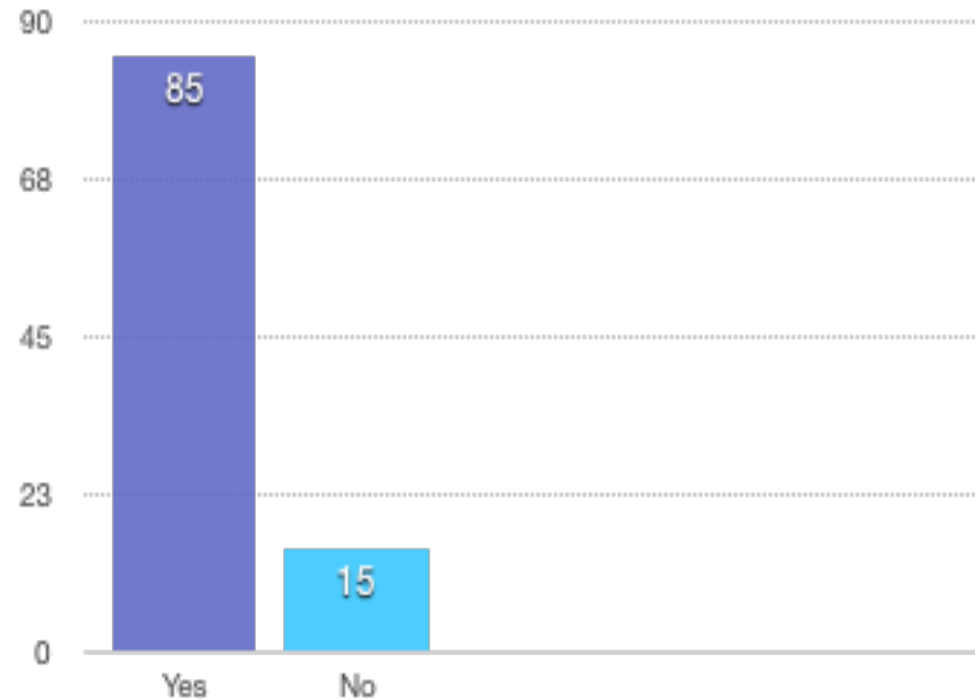
“Were the scenarios relevant, logically ordered and clear?”

“Were the practice activities effective to learning radio communication?”

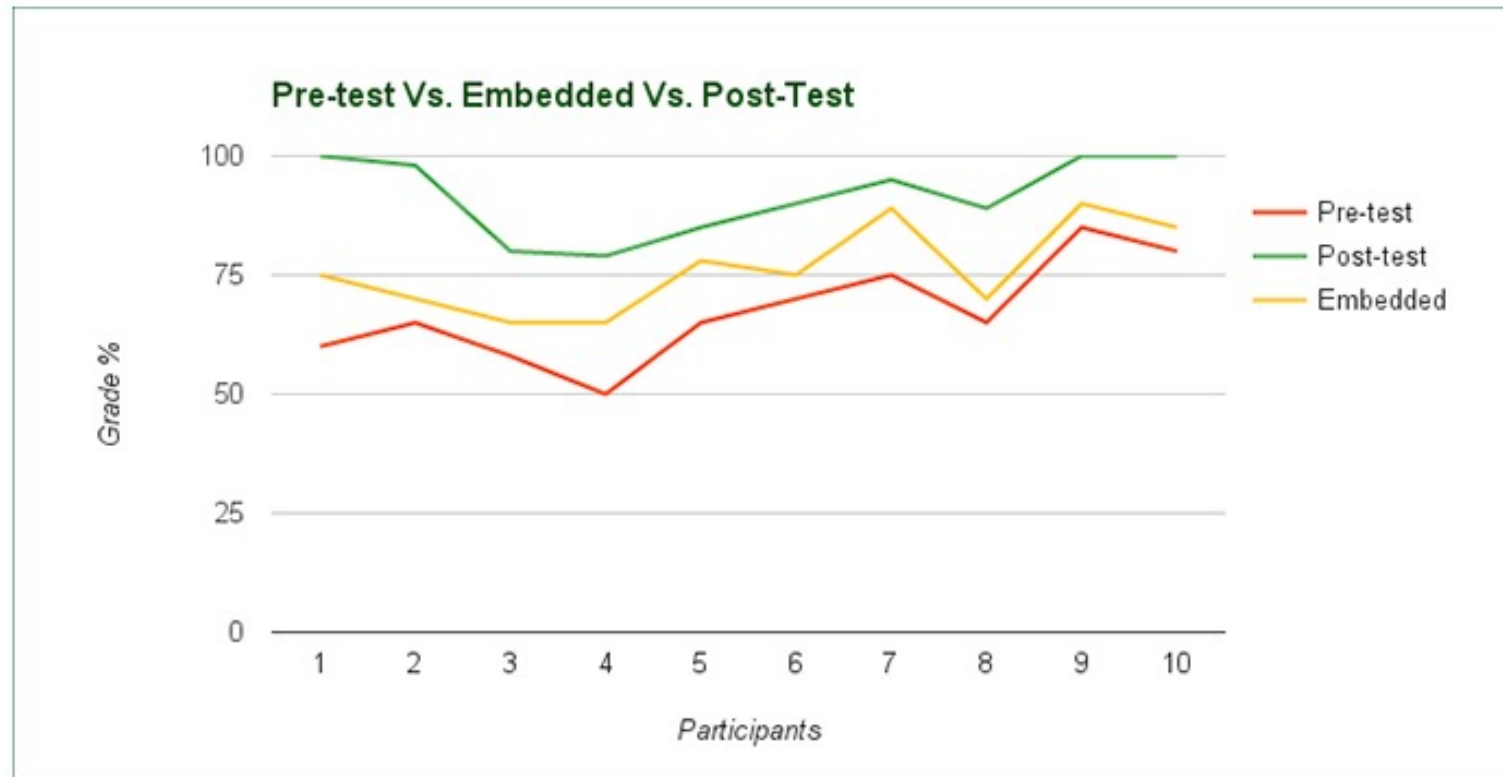


## Social Media

- Twitter



“Did participating in social media help you feel more connected?”



*Raw Data for Pre-test, Embedded and Post-test Questions (items1-15)*

## Data Analysis Results

Pre-test to Embedded 10% gain  
+ Embedded to Post 15% gain

## Implications

Theories that worked well

**Connectivist** approach (Kopp, 2011)

**SBeL** (Clark, 2012)

Tools that worked

**WordPress platform**

= design impacted **interactivity**

= **video + social media** impacted learning

Need sectional maps + images + simulations  
+ voice recognition software

## Next Steps

Re-shoot + edit videos.

Add sectional maps + images + voice recognition software.

Investigate the areas of intelligent tutors + virtual world.

Add more scenarios using case study.

Expand the student guide to include more visuals, interactive resources and accident case studies for practice activities.

Add web conferencing.

Questions?

**“Design is an opportunity to  
continue telling the story,  
not just to sum everything  
up”**

Tate Linden

Mahalo

LTEC ohana: Faculty + CF's Seamus and Koran +  
Subject Matter Experts

